

USER LEVEL COURSES

U-1	APPROPRIATE MECHANIZATION TECHNOLOGY FOR ENERGY MANAGEMENT IN AGRICULTURE	
Duration: 4 weeks	Effective working days : 20	Total Unit : 40
Beneficiary :-	Progressive farmers, farm machinery owners/operators, extension workers and related technical personnel from Govt. / semi-Govt / SAUs / NGOs etc.	

General (4 Units)

- Need for energy conservation in Agriculture.
- Scope of fuel conservation - Proper matching implements, Proper maintenance, Proper operational techniques.
- Scope of non-conventional energy sources in Agricultural Mechanization - Bio fuels, Solar energy, Wind energy.
- Selection & use of recent energy saving implements – No till drill, Raised Bed planter, Rotavator, Vertical conveyor reaper, etc.
- Selection, handling and storage of fuels and lubricants.
- Selection of appropriate crop rotation, changing planting patterns.

Energy/Fuel conservation potential

a) Farm Power(10 units)

- Importance of maintenance schedule and hand on practice
- Fuel conservation tips in farm machinery & power

b) Irrigation Systems(6 units)

- Centrifugal, submersible, jet pumps: general features, selection, installation and maintenance
- Micro irrigation system - Sprinkler, Drip, Rain gun Necessity, types, layout and installation of the system
- Adjustments, service & repair of irrigation equipments.

(c) Farm Machinery (20 units)

Introduction, adjustments, field operation servicing and maintenance of energy efficient agril. Machinery for crop production.

- Efficient hand tools for horticulture, Orchards, gardens, vegetables and crop cultivations
- Tractor drawn and self propelled energy efficient agricultural machinery:- Rotavator, Power harrow, Pulverizing roller, Subsoiler, Zero till drill, Strip till drill, Raised bed planter, Ridger seed cum fertilizer drill, Rice seeder, Rice transplanter, Post hole digger, Rotary power weeder, P.P. equipment for cotton, orchards, trees and other field crops, High clearance sprayer, Vertical conveyor reaper (V.C.R), Combine harvester, Straw combine(straw reaper), Straw baler, Forage harvester, Any other newly developed Agril. Implements/ Machines
- Energy efficient manually operated and animal drawn machinery like- Seed cum fertilizer drill, Paddy puddler, Harrow cum puddler, Improved bullock cart

U-3	OPERATION, MAINTENANCE AND MANAGEMENT OF POWER TILLER	
Duration: 2 weeks	Effective working days : 10	Total Unit : 20
Beneficiary :-	Progressive farmers, farm machinery owners/operators, extension workers and related technical personnel from Govt. / semi-Govt /SAUs / NGOs etc.	

General: 2 units

- Status of power in India for Agricultural Mechanization.
- Scope of power tiller in Indian Agriculture
- Acquaintance with different makes & models of power tillers available in India.
- Selection of power tillers

Operation and Demonstration : 10 units

- Study of different controls of a power tillers & safety instructions.
- Study of constructional features, adjustments, preventive maintenance and operating techniques of power tiller in tillage, puddling, seeding & planting, interculturing, plant protection, harvesting & post-harvesting, material handling and transporting machinery / equipment.
- Field practice with the above equipments and different seed bed preparation techniques with rotavator.
- Demonstration with special attachments i.e pit digger, tree cutter, grass cutter, etc.
- Study of ergonomic aspect in the operation of power tiller.

Repair & Maintenance: 8 units

- Study of constructional features, maintenance and repairing techniques of different systems of engine viz. air cleaning, fuel, lubrication, cooling etc.
- Study of constructional features, maintenance and repairing techniques of gear shifting mechanism, final drive & rotary drive
- Periodical maintenance and trouble shooting of Power tiller.
- Economics of operation of power tiller.

U-5	GENDER FRIENDLY EQUIPMENTS FOR WOMEN FARMERS	
Duration: 3 days	Effective working days : 3	Total Unit : 06
Beneficiary :-	Progressive farmers, farm machinery owners/operators, extension workers and related technical personnel from Govt. / semi-Govt / SAUs / NGOs etc.	

General: 2 units

- Involvement of women in Agriculture.
- Technology and Gender issue.
- Ergonomical characteristics of women farmers.
- Assessment of drudgery during work.
- Improved farm tools and Equipments for women farmers.

- Safety gadgets for hand chaff cutter.
- Safety in operation of farm tools and machinery.

Demonstration of Selected tools and equipments popular in the region: 4 units

Seed treatment drum, Acid delinters –small, medium & commercial grade, Hand Ridger, Dibbler, Manual seed drill, crust breaker, manual paddy transplanter, Hand wheel hoe, Grubber, Hand operated sprayers.- Knap sack sprayer, Foot operated sprayer, Rocking type sprayer, Ultra Low Volume sprayers, Fertilizer broadcaster, Safety kit, Improved sickles - Punjab, CIAE models, Bhindi plucker, Scythe, Hand chaff cutter, Sugarcane stripping knife, Cotton stalk puller, Horticultural tools, Tubular maize sheller, Groundnut decorticator, Pedal operated cleaner cum grader, Hanging type double screen grain cleaner, Grain mills and Dal mill with motors, Potato peeler and slicer and other equipment, Aonla pricking machine, papad and wadi making devices.

U-7	WATER MANAGEMENT THROUGH SPRINKER AND DRIP IRRIGATION AND WATER SAVING DEVICES	
Duration: 1 week	Effective working days : 5	Total Unit : 10
Beneficiary :-	Progressive farmers, farm machinery owners/operators, extension workers and related technical personnel from Govt. / semi-Govt / SAUs / NGOs etc.	

General: 2 units

- Introduction of micro irrigation system in water management and comparison with conventional irrigation practices with special emphasis on energy conservation.
- Water requirement of various crops and soil- water- plant relationship.
- Need of drip and sprinkler irrigation systems, its limitations and introduction to basic components.
- Significance of drip and sprinkler irrigation systems and rain gun.

Description, Operation and Water management: 8 units

Drip & Sprinkler irrigation system –

- Study of basic hydraulics, components, design, layout and their installation.
- Study and application of Design chart and design procedure: mains, sub mains and lateral line design charts for uniform and non-uniform slopes.
- Suitable pumping and power units for various micro irrigation systems.
- Operation, maintenance, management and trouble shooting of the above systems.
- Cost analysis of each system

U-9	SELECTION, OPERATION AND MAINTENANCE OF IMPROVED HARVESTING & THRESHING MACHINES	
Duration: 2 weeks	Effective working days : 10	Total Unit : 20
Beneficiary :-	Progressive farmers, farm machinery owners/operators, extension workers and related technical personnel from Govt. / semi-Govt / SAUs / NGOs etc.	

General: 2 units

- Scope of harvesting and threshing machines in Indian Agriculture and comparison with conventional and improved harvesting and threshing techniques already prevailing in the country.
- Acquaintance with major manufacturers of harvesting and threshing machines in India.
- Study of different harvesting machines such as tractor/ power tiller operated reaper, self propelled harvester, straw reaper etc.
- Importance of safety legislation as per BIS and acquaintance with Dangerous Machine Act; responsibility of the manufacturer, supplier and user.

Description, Operation and Maintenance: 18 units

- Principles of working, Selection criteria, Types of Mowers, Vertical conveyor reaper, Reaper Binder, Power Thresher, Combine Harvester, Maize Sheller, Groundnut Decorticator etc.
- Familiarization and study of various systems of reaper, mower, Vertical conveyor reaper, thresher, combine harvester etc. and techniques for safe operation.
- Study and demonstration of following adjustment: cutter bar height, registration and alignment of reaper and combine harvester. Cylinder speed, concave clearance, blower speed, sieve adjustment, alignment of the pegs / beaters of the thresher.
- Installation of Vertical conveyor reaper on tractor/ power tiller and installation of thresher on threshing floor, pre-starting checks, alignment of belts with prime mover, attaching thresher with P.T.O. of a tractor
- Operation and demonstration of self propelled vertical conveyor reaper, power tiller operated vertical conveyor reaper & tractor front mounted vertical conveyor reaper, depending upon the suitability / availability of crop.
- Operation and demonstration of axial flow paddy thresher, groundnut thresher, Hadamba type and multi crop thresher depending upon the suitability / availability of crops.
- Preventive maintenance and off season storage technique.
- Cost analysis of threshing and harvesting techniques over conventional methods.

U-11	SELECTION, OPERATION AND MAINTENANCE OF AGRICULTURAL MACHINERY FOR DRY LAND AGRICULTURE	
Duration: 2 weeks	Effective working days : 10	Total Unit : 20
Beneficiary :-	Progressive farmers, farm machinery owners/operators, extension workers and related technical personnel from Govt. / semi-Govt / SAUs / NGOs etc.	

GENERAL: 2 UNITS

Concept of Dry-land Farming. Importance of Rain fed farming system in Indian Agriculture. Study of different cropping patterns recommended for Rain fed farming system. Selection of crops as per Agro-climatic conditions.

MACHINERY & EQUIPMENTS FOR DIFFERENT FARM OPERATIONS (18 units)

- **Tillage machinery**

Improved Implements/Machineries for important crops, such as cereals, pulses (red gram), oil seeds (groundnut, sunflower, etc). Study, Demonstration and Maintenance of Tillage implements used in Dry land Agriculture, such as plough, rotovator, Guntaka, cultivators, etc.

- **Seeding and planting equipments**

Study and Maintenance including calibration of Seeding and Planting Equipments in Dry land Agriculture, such as Drill- plough, Inclined plate type Planter, Dibblers, etc.

Demonstration of Seeding and Planting Equipments

- **Harvesting, threshing and processing equipments**

Study and Maintenance of Harvesting, Threshing and Processing equipments/ tools used in Dry land Agriculture, such as Improved Sickles, Groundnut Digger, Reapers, Multi-crop thresher, Groundnut thresher, Groundnut Stripper, Red-gram thresher, Sunflower thresher, Maize Sheller, Groundnut Decorticator, Mini Dall- mill etc. Demonstration of Harvesting, threshing and processing equipment.

- **Interculture and plant protection equipments**

Study, maintenance and Demonstration of Interculture equipments, such as weeders, hoes, etc. and plant protection equipments.

- **Water management**

Watershed Management, Water Conservation through modern rain harvesting techniques, recharging of wells, etc

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